

REMARKS/ARGUMENTS

Status of the Claims:

Claims 1, 7, 14, 37, 51-52, 66, 112, and 114 are currently amended. Claim 17 was canceled via previous amendment. Claims 78-111 are herein canceled as being drawn to a nonelected invention. The Applicant retains the right to pursue the subject matter of claims 78-111 at a later time in a divisional application. Claim 5 is herein canceled. As such, claims 1-4, 6-16, 18-77 and 112-119 are pending in this application. Claims 1, 14, 37, 51, 66, and 112 are independent claims from which the rest of the pending claims depend.

Applicants acknowledge receipt of the Office Action dated September 19, 2007. Applicants believe all pending claims are allowable over the art of record and respectfully request reconsideration and allowance of all claims.

I. Rejections under 35 U.S.C. §102 (a)

In the Office Action, claims 1-7, 12-16, 18-20, 32-33, 36-44, & 50-70 are rejected under 35 U.S.C. §102(a) as being anticipated by Ryu *et al*, hereinafter “Ryu”, (U.S. Pat. 6,576,588 B2). The Examiner states that there is no patentable distinction between the claimed catalyst and that disclosed by the reference, and thus the claims are anticipated by the teaching of Ryu. Applicants respectfully traverse this rejection.

According to MPEP 2131, “a claim is anticipated only if each and every element as set forth in the claim is found, either implicitly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir.1987).

Amended claim 1 recites “a selective hydrogenation catalyst *consisting essentially of*: a precursor comprising at least one Group VIII metal disposed on an inorganic support; a second metal selected from the group consisting of gold, silver, zinc, Group IIIA metals, Group VIIB metals, and combinations thereof, disposed on the precursor.” Support for “gold, silver” may be found, for example, in paragraph [0045] of the specification as filed which states, “the Group IB metal is preferably silver, gold, or a combination thereof,” and Examples 4 and 5 of the specification as filed. Support for “zinc” is found, for example, in paragraph [0045] which states, “the Group IIB metal is preferably zinc,” and in Examples 10, 13, and 14 of the specification as filed.

Ryu claims “a catalyst for selective hydrogenation of acetylenes comprising a *copper* component and a member selected from the group consisting of at least one Group VIII metal component, a Ag component, a Au component and mixtures thereof on an alumina support.” The catalyst of *Ryu* necessarily includes a copper component to the catalyst. *Ryu* fails to teach compositions of catalyst without copper, and in fact refers to his catalyst as “copper catalyst,” as seen, for example, in the abstract of *Ryu*. *Ryu* states, column 2 lines 45-48, that “*copper* catalysts need improvement for the selective hydrogenation of mixed olefin feeds, which contain relatively high concentration of alkynes.” Thus, the invention of *Ryu* is specifically aimed at a “*copper* catalyst” or a “palladium promoted *copper* catalyst,” and copper is a critical component of the *Ryu* invention. Conversely, the selective hydrogenation catalyst of amended claim 1 “*consists essentially of* a precursor comprising at least one Group VIII metal disposed on an inorganic support; and a second metal selected from the group consisting of gold, silver, zinc, Group IIIA metals, Group VIIB metals, and combinations thereof, disposed on the precursor.” Thus, the catalyst as claimed in the instant claim 1 excludes copper.

In a similar manner, claim 14 recites, “a composition *consisting essentially of*: a support; a Group VIII metal disposed on the support; and a second metal selected from the group consisting of Group IIIA metals, zinc, Group VIIB metals, and combinations thereof, disposed on the support.” It is noted that, as originally filed, the second metal of claim 14 was selected from this group excluding copper.”

Amended claim 37 recites, “A catalyst active for liquid-phase selective hydrogenation *consisting essentially of*: Pd supported on particulate alumina; and a subsequently supported second metal selected from the group consisting of Ga, In, Mn, Zn, and combinations thereof.” Claim 37 has never required copper as a component.

Claim 51 has been amended to recite, “A supported catalyst for selective hydrogenation *consisting essentially of*: a Group VIII metal; and a second metal selected from the group consisting of gold, silver, zinc, Group IIIA metals, Group VIIB metals, and combinations thereof.” Support for the second metal being selected from the group comprising, “gold, silver,” is found, for example, in paragraph [0045] of the specification as filed which states, “the Group IB metal is preferably silver, gold, or a combination thereof,” and Examples 4 and 5 of the specification as filed. Support for “zinc” is found, for example, in paragraph [0045] which

states, “the Group IIB metal is preferably zinc,” and in Examples 10, 13, and 14 of the specification as filed.

Claim 66 has been amended to recite, “A supported catalyst for selective hydrogenation *consisting essentially of*: a first metal selected from the group consisting of Group VIII metals and combinations thereof; and a second metal selected from the group consisting of Group IIIA metals, zinc, Group VIIB metals, and combinations thereof.” As originally filed and currently pending, the second metal of claim 66 excludes copper.

Copper is a Group IB metal, and it is excluded from the present invention as claimed in independent claims 1, 14, 37, 51, and 66. *Ryu* does not disclose the invention as claimed, but rather, as stated in column 2 lines 35-37, focuses on catalysts containing copper, because such catalysts “are highly selective in retaining diolefins such as 1,3-butadiene by being very selective to acetylenes hydrogenation.” *Ryu* does not anticipate the catalyst or composition as claimed in the instant claims 1, 14, 37, 51, and 66, which first and second metals do not contain copper. It is thus respectfully requested that the §102 rejections to independent claims 1, 14, 37, 51, and 66 be removed and the claims allowed.

Dependent claims 2-7 and 12-13 depend from claim 1; claims 15-16, 18-30, 32-33, and 36 depend from independent claim 14; claims 38-44 and 50 depend from independent claim 37; claims 52-65 depend from independent claim 51; and claims 67-70 depend from independent claim 66. As these dependent claims carry with them each and every limitation of the respective independent claim from which they directly or indirectly depend, *Ryu* also fails to anticipate these dependent claims for at least the reasons given for the independent claims. It is thus respectfully requested that the §102 rejections to independent claims 1, 14, 37, 51, and 66 and dependent claims 15-16, 18-30, 32-33, 36, 38-44, 50, 52-65 and 67-70 depending therefrom be removed and the claims allowed.

II. Rejections Under 35 U.S.C. §103 (a)

A. Claims 8-11, 21, 31, 34-35, 45-49 & 71-77

In the Office Action, claims 8-11, 21, 31, 34-35, 45-49 & 71-77 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Ryu et al*, hereinafter “*Ryu*”, (U.S. Pat. 6,576,588 B2) as applied to claims 1-7, 12-16, 18-20, 22-30, 32-33, 36-44, & 50-70 above, and in further view of *Brown et al*, hereinafter “*Brown*”. Applicants respectfully traverse this rejection. Claims 8-11

depend directly or indirectly from independent claim 1; claims 21, 31, and 34-35 depend directly or indirectly from independent claim 14; claims 45-49 depend directly or indirectly from independent claim 37, and claims 71-77 depend directly or indirectly from independent claim 66.

The Examiner states on page 3 of the Office Action that, “Ryu ‘588 discloses a catalyst as described above, except for the claimed Group VIIB metals (or Mn).” Applicants respectfully traverse, and reiterate, as discussed in Section I hereinabove, that *Ryu* fails to disclose the present invention as claimed in independent claims 1, 14, 37, 51, and 66. According to MPEP 2143.01, “obviousness can be established by modifying the teachings of the prior art *to produce the claimed invention* where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). [Emphasis added.] Without conceding that it would be proper to do so, Applicants point out that combining the teachings of *Ryu* with *Brown* would not produce the claimed invention, as the claimed invention excludes copper, while *Ryu* is concerned specifically with a *copper* catalyst, as discussed in Section I hereinabove. *Brown* is cited for the purpose of providing disclosure of “Group VIIB metals, such as manganese,” and not for the purpose of making up for the lack of teaching by *Ryu* of the catalyst specifically disclosed in the independent claims 1, 14, 37, 51, and 66. As *Brown* fails to make up for the lack of teaching by *Ryu*, a *prima facie* case of obviousness has not been made.

As they depend from independent claim 1, dependent claims 8-11 are submitted to be patentable over *Ryu* for all of the same reasons put forth in Section I above. Similarly, claims 21, 31, 34-35 that depend from independent claim 14, claims 45-49 that depend from independent claim 37, and claims 71-77 that depend from claim 51 are submitted to be patentable over *Ryu* for all of the same reasons put forth in Section I above.

Furthermore, the Examiner states “it would have been *prima facie obvious* to one of ordinary skill in the art at the time of invention was made to incorporate by adding these metal components into the catalyst of *Ryu* in order to achieve an improved catalyst having improved performance and activities because they are known as useful catalyst materials as evidenced by *Brown*.” Applicants respectfully traverse.

The Examiner notes claims 7 and 19. In claims 7 and 19, *Brown* recites, “spinel is selected from the group consisting of zinc, magnesium, calcium, beryllium, strontium, barium, radium, iron, manganese, zirconium, molybdenum, ruthenium, rhodium, cobalt, germanium, tin, and combinations of any two or more thereof.” The Group VIIB metals (or Mn) disclosed by *Brown*

are indicated to be the metal of which the spinel consists. The spinel is the inorganic support for the composition. In the claims of the present instance, the Group VII metals (or Mn) are disposed *on* the support, and are not the metal of which the support is made. Thus, *Brown* does not teach, as the present claims disclose, the second metal disposed *on* the support or *on* a precursor comprising a support. Thus, *Brown* does not disclose the manganese or Group VIIA metal as claimed in claims 8-11, 21, 31, 34-35, 45-49, and 71-77, and a *prima facie* case of obviousness is further lacking.

Nowhere in *Brown* or *Ryu* is it suggested that it would be desirable to use Group VIIB (or manganese) as a promoter disposed *on* the catalyst. Also, combining the *Brown* reference with the teachings of *Ryu* would not yield the catalysts disclosed by claims 8-11, 21, 31, 34-35, 45-49 and 71-77 but rather a *copper* catalyst having, for example, manganese being the material from which a spinel support was made, and not a promoter disposed on an inorganic support. Thus, the combination of the teachings of *Ryu* with those of *Brown* would not give one a reasonable expectation of success in creating the catalysts or compositions claims 8-11, 21, 31, 34-35, 45-49, and 71-77, and another element in the *prima facie* case of obviousness is thus missing.

Applicants respectfully submit that a combination of *Ryu* and *Brown*, if proper, fails to provide the invention as claimed in claims 8-11, 21, 31, 34-35, 45-49, and 71-77. Accordingly, no *prima facie* case of obviousness can be established. Applicants respectfully request withdrawal of the §103(a) rejections to and allowance of claims 8-11, 21, 31, 34-35, 45-49 and 71-77.

B. Claims 112-119

On page 4 of the Office Action, the Examiner rejects claims 112-119 under 35 U.S.C. §103(a) as being unpatentable over *Ryu*. Applicants respectfully traverse. Claim 112 is an independent claim from which claims 113-119 depend.

The Examiner states that, “Product-by-process in the claims are noted. While the catalyst of the references is not made by the same process, the catalyst disclosed is the same as being claimed.” Applicants respectfully traverse.

Amended claim 112 recites, “a hydrogenation catalyst made by ; wherein the first metal comprises a Group VIII metal and wherein the second metal is selected from the group consisting of Group IIIA metals, zinc, Group VIIB metals, and combinations thereof; wherein the hydrogenation catalyst *consists essentially of* the support, 0.1% - 1.0% by weight of the first

metal to final weight of the catalyst and 0.05% - 1.2% by weight of the second metal to final weight of the catalyst; and wherein”

As copper is not one of the metals disclosed as the first metal or the second metal, and the hydrogenation catalyst *consists essentially of* the support and first and second metals, the catalyst disclosed in claim 112 is distinct from the catalyst of *Ryu*, which, as discussed in Section I hereinabove, necessarily comprises copper. Because the catalyst compositions of *Ryu* and claim 112 are different, the process of claim 112 produces a novel catalyst. It is thus respectfully requested that the §103 rejection to independent claim 112 and claims 113-119 depending therefrom be removed and the claims allowed.

III. Other Comments

In section 7 of the Office Action (page 4), the Examiner states that, “the transitional phrase “consisting essentially of” in the independent claims is noted. It is considered *Ryu* ‘588 anticipates the instant claims because he teaches a catalyst, which does not contain a halogen component *or metal components other than those being required* in the instant claims.” Applicants respectfully traverse. *Ryu* requires copper, while the instant catalyst excludes copper.

It is noted that none of the independent claims of the present invention as previously submitted in response to the office action dated September 8, 2006, required copper. Specifically, independent claims 14, 37, 66, and 112 as previously submitted, explicitly excluded copper, and independent claims 1 and 51 allowed, but did not mandate copper. *Ryu* discloses a *copper catalyst*, which necessarily comprises copper. It is noted that none of the Examples in the specification as filed exemplified the use of copper.

CONCLUSION

Applicants respectfully request reconsideration, allowance of the pending claims and a timely Notice of Allowance be issued in this case. If the Examiner feels that a telephone conference would expedite the resolution of this case, the Examiner is respectfully requested to contact the undersigned.

In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art that have yet to be raised, but which may be raised in the future.

If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769.

Respectfully submitted,

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